

# A PALAEOCENE TEREDINID (MOLLUSCA) FROM IRAQ

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**ABSTRACT.** The teredinid mollusc *Bankia* (*Bankiella*) *kurdistanensis* sp. nov. is described from an association of tubes, valves, and pallets in the Palaeocene of Iraq.

WOOD bored by *Teredo* and allied genera is a common Tertiary fossil at various levels and localities, as in the London Clay of England. Current zoological classification of these highly modified molluscs is based neither on the valves nor on the conspicuous tubular shell-lined borings, but on the morphology of the little calcareous structures known as pallets, which in life are associated with the fleshy siphons. Such pallets are not commonly recorded as fossils. Although the Iraqi material described below was in solid preservation not permitting the isolation of pallets, numerous thin-sections show these and other structures excellently preserved.

The specimens, of petrified dicotyledonous wood showing well-preserved structure and riddled with calcite-filled teredinid burrows, were collected from the Kolosh Formation (van Bellen 1959). This is composed of sands and sandstones of detrital serpentine, chert, and radiolarite, with subordinate shales and limestones, and outcrops extensively in northern Iraq. It has yielded foraminiferal faunas and an algal microflora of Palaeocene–Lower Eocene age, as well as some molluscs and other macrofossils. The present material comes from three separate localities, but all the pallets seen in sections are of one distinctive type, suggesting that one species only is present.

In a revision and classification of the Teredinidae, Bartsch (1922) subdivided the genus *Bankia* Gray 1842, which comprises those forms whose pallets show cone-in-cone structure. Such pallets consist of a proximal rod-like portion or stem, from which a series of laterally flattened cones, opening distally, arise one within the other, together forming a blade-like structure. In the subgenus *Nausitora* the cones are fused on one flattened side and backed by a calcareous deposit ('thick periostracum' of Bartsch). In the three subgenera *Bankia* s.s., *Bankiella*, and *Neobankia* the cones are free and covered by a thin investing membrane; distally this membrane is fimbriated in *Bankia* s.s., entire in *Bankiella*, and denticulated in *Neobankia*.

*Nausitora*-pallets showing calcareous fusion might be expected to occur as fossils and have in fact been recorded from the Lower Eocene London Clay (Wrigley 1930). The Iraqi fossils now discussed show pallets with free cone-in-cone structure and entire margins. It would at first sight seem doubtful that the membrane permitting subgeneric differentiation would be preserved, and hence that *Bankia* s.l. would be the best allocation that could be made. However, Stinton (1957) described denticulated-margin pallets recognizable as *Neobankia* from the Upper Eocene Barton Clay. This preservation is probably inferior in fine detail to that of the material now examined. It seems likely, therefore, that the entire margins seen are original, and for this reason the fossil is referred to *Bankiella*.

Genus *BANKIA* Gray 1842  
 Subgenus *Bankiella* Bartsch 1921  
*Bankia (Bankiella) kurdistanensis* sp. nov.

Plates 51, 52

*Diagnosis.* *Bankia* with pallets of 4.3 mm. length or more, maximum diameter about 2.5 mm., of flattened cone-in-cone type, about fifteen cones with distal margins entire, free stem presumed relatively short. Valves incompletely known; tubes typically variable in length and diameter, incipiently septate in large examples.

*Holotype.* BM LL30332 (Pl. 51, fig. 1), Kolosh Formation (Palaeocene), Dohuk, Mosul Liwa, northern Iraq. *Paratypes.* BM LL30333-5 incl. (Pl. 51, figs. 2, 3; and Pl. 52, figs. 1, 2), Kolosh Formation (Palaeocene), Dohuk, Mosul Liwa, and Koi Sanjak, Erbil Liwa, northern Iraq.

*Other material.* Specimens from the Kolosh Formation (Palaeocene), of Shaqlawah and Koi Sanjak, Erbil Liwa, and Dohuk, Mosul Liwa, northern Iraq.

*Description.* (a) *Tubes.* The calcite- or matrix-filled shelly tubes show great variety both in size and degree of crowding. In diameter they vary from 1.5 to 12.0 mm. The larger examples may have reached a length of 20 cm. or more, though this cannot be proved from the pieces of bored wood collected. These specimens show all the usual varieties of wood penetrated by straight parallel tubes, small, crowded, and twisted tubes, &c. Some larger tubes show a regular, narrowly annular internal septation (Pl. 52, fig. 2); in an example of 5 mm. tube-diameter the septa are 2 mm. apart. This feature is developed in individuals of some Recent teredinid species. In one fossil tube the section shows two smaller, conjoined but complete tubes, associated with matrix. This is presumably the broken apertural end, out of position: such a constricted double apertural siphonal tube has been described from the London Clay by Sowerby (1815), Davis (1936), and Wrigley (1940); the last, by analogy with Recent species, did not regard it as of specific value. Only two examples have been seen in the Iraqi material (BM LL30331).

(b) *Valves.* The valves are known only from cross-sections of two paired examples (Pl. 51, fig. 2; Pl. 52, fig. 1). Presumably they were of the specialized pattern common to the family (Bartsch 1922, Stinton 1957), functioning as excavating tools. The distinctive

EXPLANATION OF PLATE 51

*Bankia (Bankiella) kurdistanensis* sp. nov., thin-sections,  $\times 15$ . Kolosh Formation, Palaeocene; Dohuk, Mosul Liwa (fig. 1); and Koi Sanjak, Erbil Liwa, northern Iraq (figs. 2, 3).

Fig. 1. Vertical section of pallet (in two pieces) at right angles to maximum width of the pallet blade. In calcite-filled burrow, in dicotyledonous wood. Holotype, BM LL30332.

Fig. 2. Oblique section through blade of pallet, showing stem, cones, and concave pallet-face; also the two valves. Post-mortem association in burrow. Paratype, BM LL30334.

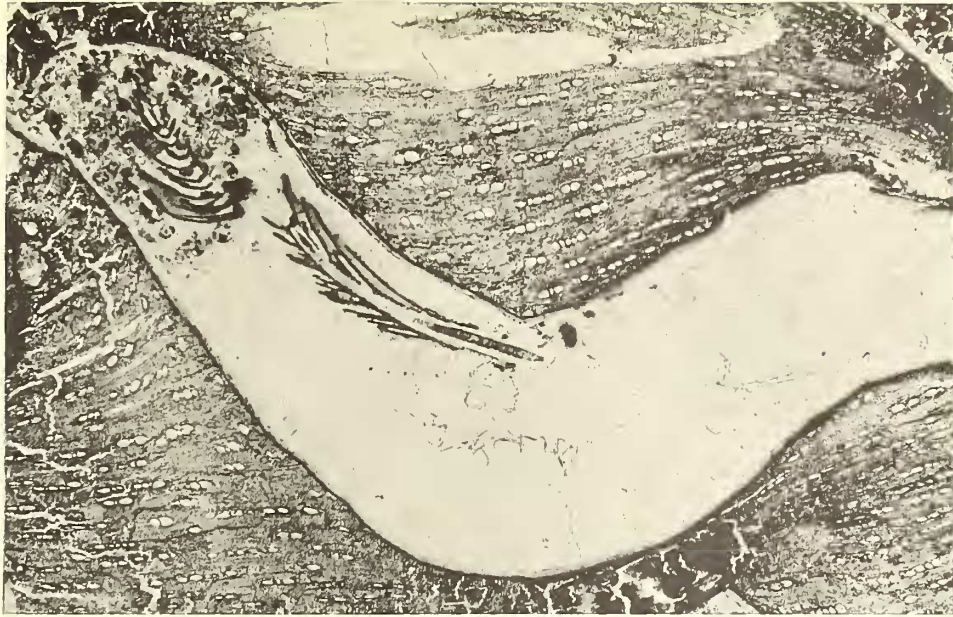
Fig. 3. Oblique and transverse sections of two adjacent pallets in burrow. Not in position held during life. Paratype, BM LL30334.

EXPLANATION OF PLATE 52

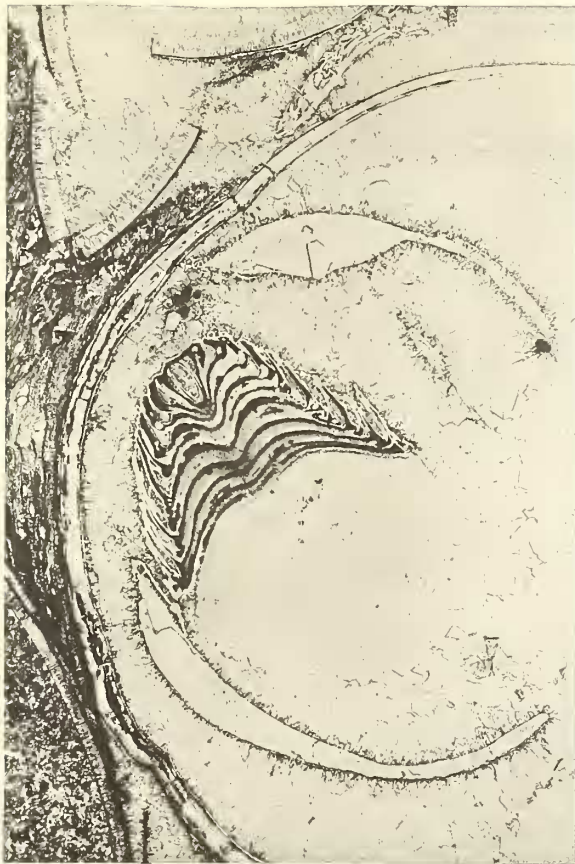
*Bankia (Bankiella) kurdistanensis* sp. nov., thin-sections,  $\times 15$ . Kolosh Formation, Palaeocene; Dohuk, Mosul (fig. 1); and Koi Sanjak, Erbil Liwa, northern Iraq (fig. 2).

Fig. 1. Approximately vertical section of two associated valves, one showing well the external ridges used for mechanical excavation. In burrow, in wood. Paratype, BM LL30333.

Fig. 2. Portion of longitudinal section of large burrow, showing spaced annular septa on inside of shelly lining to burrow (conspicuous calcite parting on one side). Paratype, BM LL30335.



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